REMARKS

Re-examination and reconsideration of the subject matter identified in caption, pursuant to and consistent with 37 C.F.R. §1.111, and in light of the remarks which follow, are respectfully requested.

Claims 9-12 have been rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 5,500,607 (Verkuil) in view of Japanese Patent Document No. 08-166407 (Kusumoto et al '407) for the reasons set forth in paragraph (3) thereof. Reconsideration of this rejection is requested for at least the reasons which follow.

Verkuil '607, at column 3, lines 35-36, refers to "a round tip with a radius of curvature on the order of one-half (0.5) mils (or as expressed in microns, 12.5μm)." However, this dimension of 12.5 μm is present only when the probe needle is being manufactured and is not the one used in the test probe for the semiconductor device. The passage at column 5, lines 15-22 of Verkuil '607 states that "As a result of the controlled plastic deformation of the probe tip 12 according to the invention, the probe tip 12 comprises an optimal shape for POS electrical characteristic measurements." That is, the tip 12 of this patent, when it is used, has a radius of curvature completely different from that of the present invention.

Also, the probe disclosed in Verkuil '607 is used, as explained in column 2, lines 43-49, to conduct a Probe-Oxide-Semiconductor (POS) electric characteristic measurement or insulation breakdown test of the oxide (in Figs. 2 and 6, the dielectric layer 16 is an oxide film and the substrate 14 is a semiconductor substrate). It is to be noted that the term "deformation" as used in Verkuil '607 means the deformation of the probe needle shown in Fig. 2 to the probe shown in Fig. 4. Thus, the probe needle of Verkuil '607 is not intended to break the oxide film on the electrode and conduct a shear deformation of the electrode. Verkuil '607 fails to disclose the concept of establishing a stable electrical conduction

between the probe needle and the electrode pad nor the concept of generating a shear (slide deformation) in the electrode.

On the other hand, in the present invention, the tip of a probe needle is pressed against an electrode pad and moved laterally to scrub it, whereby the oxide film on the electrode surface which increases the contact resistance is sheared and removed together with the metal surface of the electrode pad (as described in connection with the first embodiment beginning on page 6 of the present specification).

Thus, the present invention differs from Verkuil '607 in the structure of the probe needle and in the inventive concept. Also, Verkuil '607 fails to suggest or disclose the concept of providing "a stable electrical conduction" of the present invention and fails to provide the advantageous results of the present invention. Thus, there is no motivation in Verkuil '607 to arrive at the present invention. (*See* attached FIG. 1).

JP '407 was cited on the PTO-1449 form filed as an Information Disclosure Statement on August 22, 2003. This document was cited on the PTO-892 form attached to the Office Action mailed June 9, 2006. The copy of this document on the PTO image file wrapper is a machine translation. In the interests of accuracy, Applicants are submitting herewith English translations of pages 7, 17 and 22 of JP '407.

Kusumoto et al '407, at paragraph [0023] states that "When the tip end portion of the probe pin is formed with unevenness and has excessive surface roughness, even if the tip end has a proper shape, contact is made only at a convex portion to make the contact area extremely small." Further, at paragraph [0024], Kusumoto et al '407 states that "it is also extremely important that the surface property of the tip end portion be controlled. It is recommended that the maximum roughness be set to 2 μm or less, preferably 1 μm or less, more preferably 0.8 μm or less." The Table on page 5 (Run 5) even indicates the surface roughness may be 0.6 μm. However, there is no description at all as to the radius of

curvature and the surface roughness of the spherical surface for bringing the probe needle into contact with an electrode pad at a preferable angle to scrub, thereby breaking and eliminating the oxide film in layers to establish a god contact.

In Fig. 8 of the present invention, wherein a relationship between the number of contacts and the surface roughness of the probe needle tip portion is illustrated, it is clear from the data that the number of probe contacts significantly increases when the surface roughness is equal to or less than 0.4 μm. When the surface roughness is large, a suitable angle between the probe needle tip portion and the electrode pad cannot be established, and it is impossible to generate a shear in the electrode and to purge the electrode surface together with the oxide on the electrode surface (*See* attached FIGS. 2 and 3). That is, the present invention provides a significant, meaningful numeral relationship between surface roughness and radius of curvature which significantly extends the contact life of the probe. This result could not have been predicted from the disclosures of the cited art.

In view of the foregoing, the present invention is not obvious from Verkuil '607 and Kusumoto et al '407 in combination. Accordingly, the §103(a) rejection based on Verkuil '607 in view of Kusumoto et al '407 should be withdrawn.

Claim 9-12 also have been rejected under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,646,455 (Maekawa et al) in view of JP '407 for the reasons set forth in paragraph (4) of the Official Action. Reconsideration of this rejection is requested for at least the following reasons.

Maekawa et al '455 discloses a probe needle having a radius of curvature of 13 μm, but fails to disclose the presently claimed surface roughness feature which is significant for greatly improving the contact life. The significance of the numeral limitation is illustrated in Fig. 8 of this application and is not suggested by the combination of Maekawa et al '455 and

Kusumoto et al '407. The deficiencies in the disclosure of Kusumoto et al '407 have been discussed previously.

For at least the aforementioned reasons, the §103(a) rejection over Maekawa et al '455 in view of Kusumoto et al '407 should be withdrawn.

Claims 9-12 were provisionally rejected on the ground of obviousness-type double patenting over claims 1-6 of copending Application No. 11/206,167 for the reasons set forth in paragraph (6) of the Official Action.

While not conceding the propriety of this rejection, Applicant is submitting herewith a Terminal Disclaimer to expedite prosecution. The filing of a terminal disclaimer to obviate a rejection based on nonstatutory double patenting is not an admission of the propriety of the rejection. Quad Environmental Technologies Corp. v. Union Sanitary District, 946 F.2d 870, 20 USPQ2d 1392 (Fed. Cir. 1991). The court indicated that the "filing of a terminal disclaimer simply serves the statutory function of removing the rejection of double patenting, and raises neither a presumption nor estoppel on the merits of the rejection."

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at (703) 838-6683 at his earliest convenience.

Respectfully submitted,

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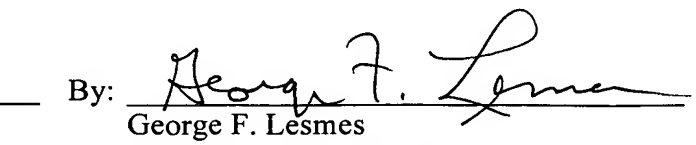
Date: September 8, 2006 By: 

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